A better way to search for traces of life on Mars — and beyond!

September 29, 2020

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by Patrick Gasda

In the disappointing absence of little green aliens on one of Jupiter's moons or a canal-building civilization on Mars, hunting for life beyond Earth stretches our scientific and technological prowess to the limits. If we do find life out there, it will be tiny, on the molecular scale.

After a successful launch in late July, NASA's Perseverance rover is sailing silently through space on its seven-month journey to Mars, where it will scour Jezero Crater for evidence of habitability and life. In this peaceful interlude before the rover's Red Planet touchdown early next year, we have time to think about future missions seeking life on other planetary bodies across the solar system.

Those missions will hunt for biological organic molecules, the carbon-based building blocks that make up all living things that we know. That's because, if we eventually do find life — or evidence of past life — on Mars or somewhere else, it's not going to be a little green alien. It's going to be a biomolecule or fossilized bacterial life.

The search focuses on habitable environments on Mars and beyond. Recent missions to the outer planets have observed evidence of water-vapor plumes from Jupiter's moon Europa, which raises the intriguing possibility of organic molecules on its surface, originating from the ocean below. Spacecraft have detected organic molecules within plumes emanating from Saturn's moon Enceladus. Most recently, NASA's Dawn spacecraft flew within 22 miles (35 kilometers) of the surface of Ceres, a dwarf planet in the asteroid belt, and detected brine and a likely vast, deep reservoir of liquid salt water.

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